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Accumulation of Protoporphyrinogen IX prior to Protoporphyrin IX in Intact Plants Treated with Protoporphyrinogen IX Oxidase-Inhibiting Herbicides

Shinji Murata[1)], Yukio Kimura[1)], Tsutomu Mabuchi[1)] and Yuzo Miura[1)]

1) Research Division, Nihon Nohyaku Co., Ltd.

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Abstract:
A combination of two conventional methods of porphyrins analysis revealed a significant accumulation of protoporphyrinogen IX (Protogen) prior to protoporphyrin IX (Proto IX) in cucumber (*Cucumis sativus* L.) cotyledons immediately after the foliar application of a protoporphyrinogen IX oxidase (Protox)-inhibiting herbicide, pyraflufen-ethyl. The accumulation of Protogen peaked at 4 to 7 hr and then decreased with the increase of Proto IX. Although a similar time-course of Protogen accumulation was observed in cucumber cotyledons treated with another Protox-inhibiting herbicide, acifluorfen, the amount of Proto IX accumulated was 2 to 3 times lower than that after the pyraflufen-ethyl treatment. Furthermore, a foliar application of pyraflufen-ethyl caused a significant accumulation of Protogen rather than Proto IX in cleavers (*Galium aparine* L.) after 7 hr, while little accumulation of Protogen and Proto IX took place in wheat (*Triticum aestivum* L.). © Pesticide Science Sociey of Japan

Keywords:
pyraflufen-ethyl, acifluorfen, herbicide, protoporphyrinogen IX oxidase, protoporphyrin IX

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